

# TRENCH OPTICAL DEVICE

## Abstract

A semiconductor device is formed in on a semiconductor substrate starting with a first step, which is to form a wide trench and a narrow trench in the substrate. Then form a first electrode in the narrow trench by depositing a first fill material of a first conductivity type over the device to fill the wide trench partially and to fill the narrow trench completely. Etch back the first fill material until completion of removal thereof from the wide trench. Form a second electrode in the wide trench by filling the wide trench with a second fill material of an opposite conductivity type. Anneal to drive dopant both from the first fill material of the first electrode into a first outdiffusion region in the substrate about the periphery of the narrow trench and from the second fill material of the second electrode into a second outdiffusion region in the substrate about the periphery of the wide trench.